



1400 Pike Street  
Marietta, Ohio 45750

October 23, 2019

VIA ELECTRONIC FILING

Marlene H. Dortch, Secretary  
Federal Communications Commission  
445 12th Street, S.W., Room TW-B204  
Washington, DC 20554

**Re: Notice of Ex Parte in WC Docket Nos. 19-126 and 10-90**

Madam Secretary:

In accordance with Section 1.1206 of the Commission's rules,<sup>1</sup> we hereby provide notice of an oral and written ex parte presentation in connection with the above-captioned proceedings.

On Wednesday, October 23, Tom Reid of the Reid Consulting Group met via web conference with Joel Miller on behalf of Commissioner O'Rielly.

The purpose of our meetings was to review the interim results of the Buckeye Hills Regional Council's broadband study funded by the Appalachian Regional Commission for which Reid Consulting Group is providing professional services. The Appalachian Partnership for Economic Growth has also endorsed our findings and we present on their behalf as well.

Specifically, our presentation highlights the persistent digital desert afflicting low population density areas of Appalachian Ohio. We also explained proposed solutions through modification of the Rural Digital Opportunity Fund (RDOF). We further presented our own cost study, or "mini-CAM," and data regarding the service area to support our proposed modifications to the RDOF.

Sincerely,

Tom Reid

Broadband Consultant for the Buckeye Hills Regional Commission  
President of the Reid Consulting Group

Attachment: Cracking the Appalachian Ohio Broadband Puzzle updated version dated 23 October 2019

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<sup>1</sup> 47 C.F.R. § 1.1206



# Cracking the Rural Broadband Puzzle

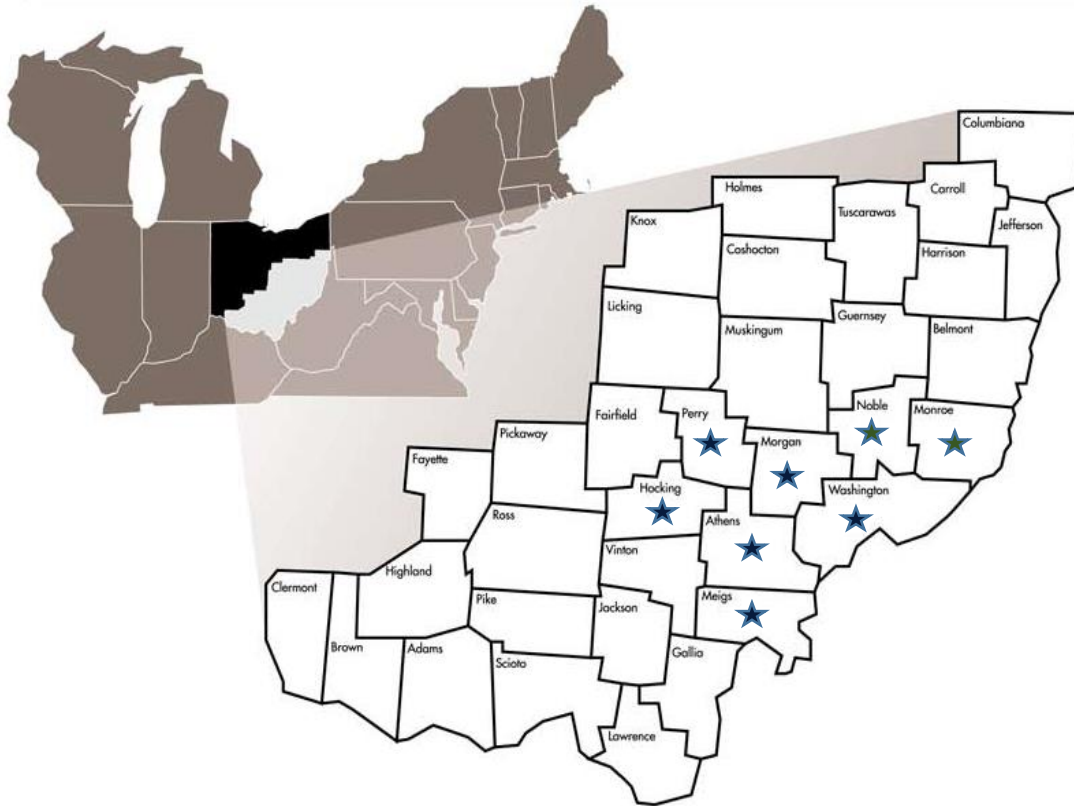


23 October 2019

[Tom@ReidConsultingGroup.com](mailto:Tom@ReidConsultingGroup.com)



# Connecting Appalachia



## Tremendous Regional Collaboration

- Economic Development Agencies
- Healthcare Providers
- K-12 Information Technology Centers
- County Commissioners
- Higher Education

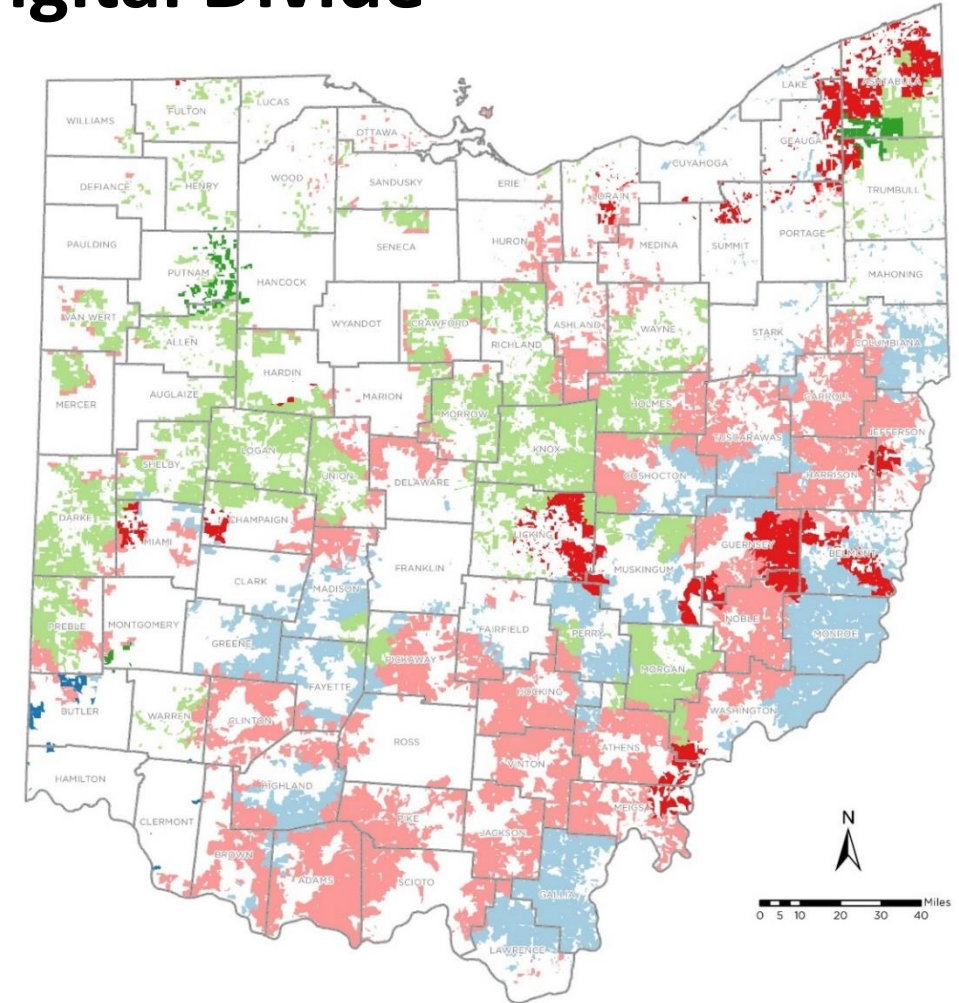
**\$130 million in middle mile fiber builds in the last ten years**

“Starred” counties in the current ARC-funded study

# FCC Connect America Phase II (CAF II) Meant to Solve the Digital Divide

## 2015-2020 Funding

Incumbent Carrier	# of Unserved Locations	CAF II \$ 2015-2020
Frontier	66,592	\$137 million
CenturyLink	47,707	\$96 million
AT&T	37,603	\$89 million
Windstream	13,073	\$25 million
<b>Totals</b>	<b>164,975</b>	<b>\$347 million</b>



Sufficient funding to blanket the area with at least the 10/1 FCC requirement of the time



# In the digital desert... McDonalds as Study Hall

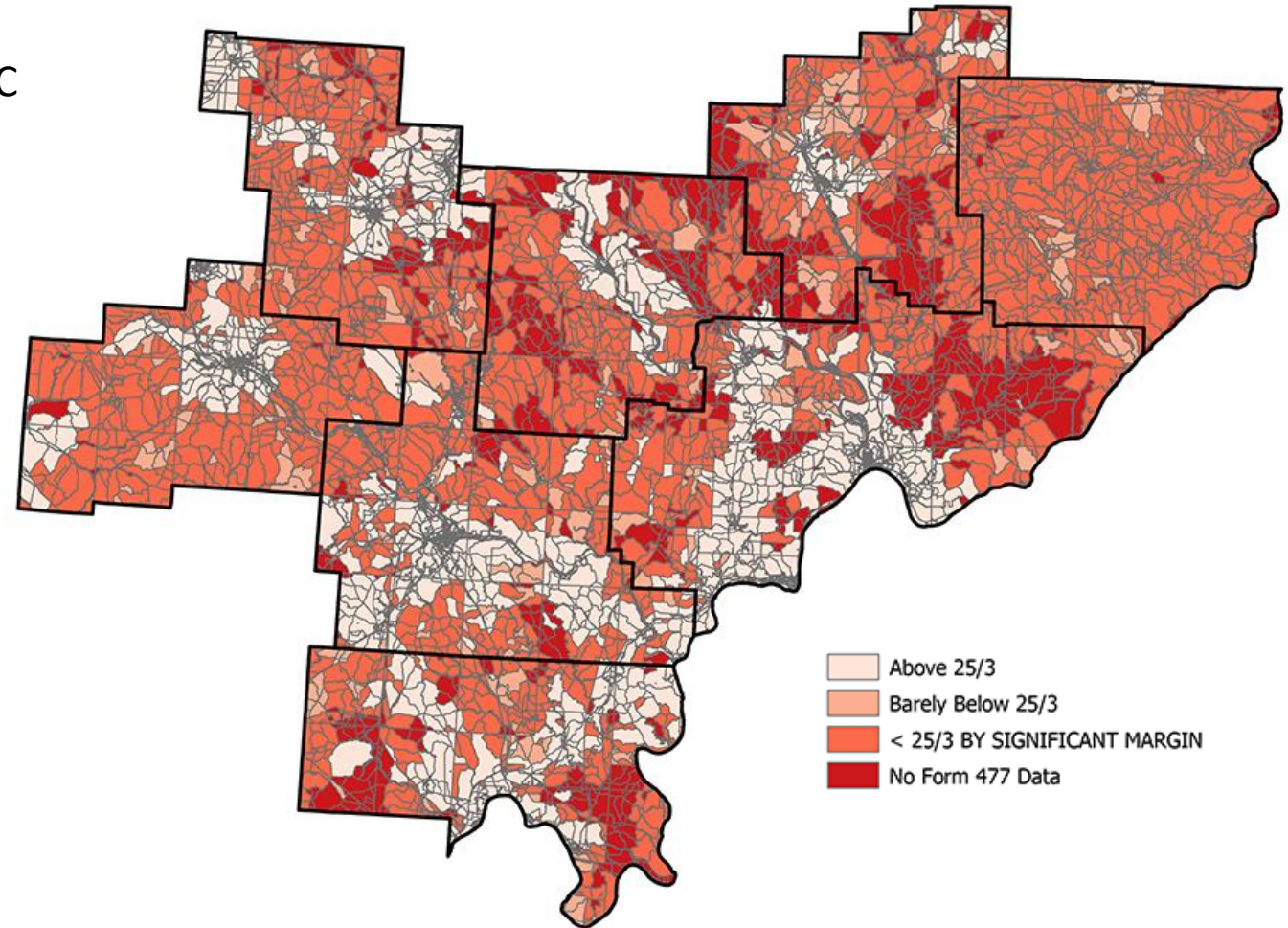
- Even more prevalent today than when published in 2013
- More schools assume home broadband in types of assignments
- Snow-day e-school becoming common
- Huge handicap for job seekers as well
- Precludes remote work opportunities



[Wall Street Journal on Jan 28, 2013](#)

# Digital Desert Persists

- Combination of FCC Form 477 Data and USAC HUBB Data reveals a stark image of the digital desert
- 75% of the 8-county study area lacking broadband according to current FCC definition of 25/3
- Further, in many areas availability severely limited due to deteriorating copper cables



# Reality Even Worse

Any 100,000 households in rural expanse*			
5,000 to 8,000 square miles			
Source	FCC Form 477	Research-Informed Correction Factor	
Measure	Trusted, not verified	5x	10x
10/1 Broadband Availability	62%	12%	6%
Unserved	38%	88%	94%
Unserved Households	38,000	87,600	93,800

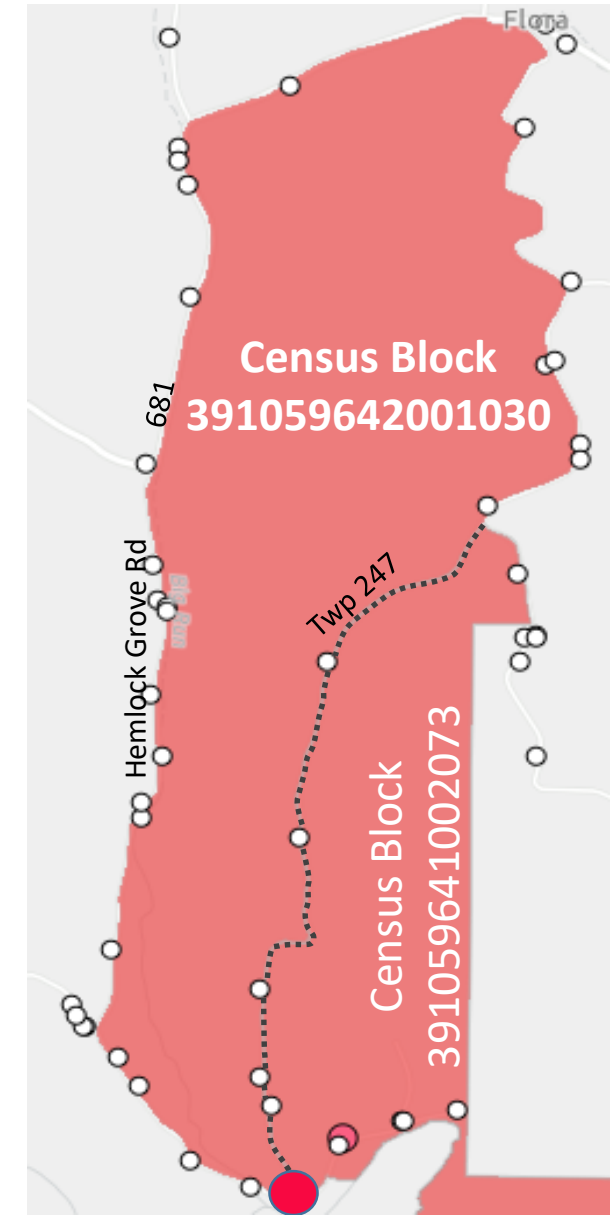
- Research utilized combination of FCC Form 477 and USAC HUBB data
- Helps in understanding the magnitude of the broadband availability problem
- Does **not** identify defensibly unserved areas to escape “carve-outs” meant to prevent over-building and/or double funding of service areas



# De Minimis Deployments Leave Many Households Unserved

- Typical Example
  - Census Block 391059642001030 in Meigs County, Ohio
  - 740 Acres
  - 12 households per square mile
  - 14 Households in block, many others adjacent (white dots)
- Funded under CAF II
  - Frontier deployed broadband to one household (pink dot in far south of block)
  - Letter of the law satisfied, but certainly not the spirit
  - Entire census block mapped as served by FCC
  - Thus blocked from receiving funding from other programs

**13:1 Over-Estimation of Coverage**





# De Facto Cooper Abandonment Exacerbates Issues

- Incumbent telcos petitioning to abandon aged copper cables – **doing it de facto now**
- Yet accepted hundreds of millions to provide broadband across the same cables
- Allowed to deteriorate in place
- Insufficient to provide reliable telephone service let alone broadband
- Staffing so low that restoration takes multiple weeks
- Poses life/safety risks, particularly in areas also lacking cell service (**much more prevalent than maps indicate**)



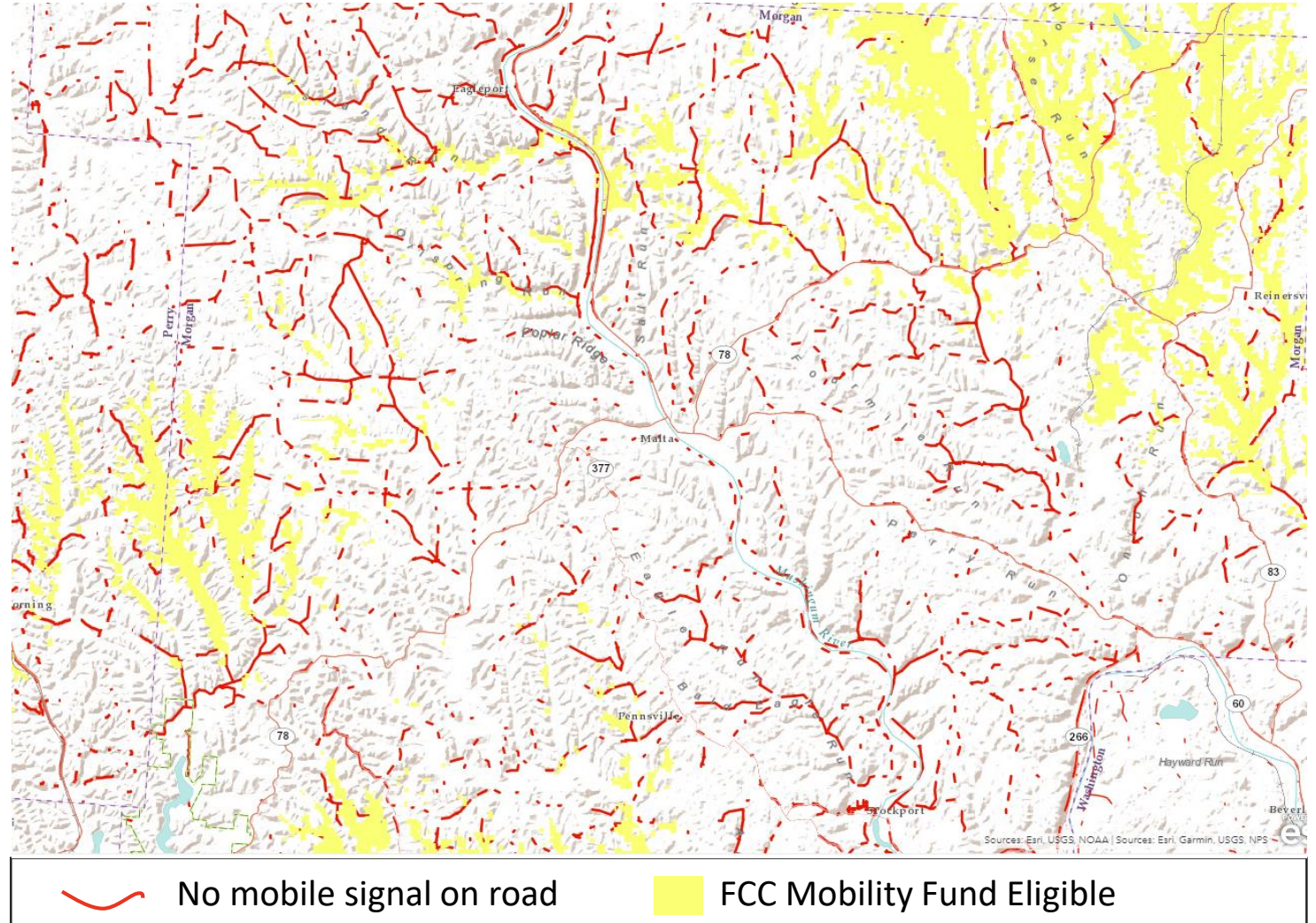
Note: AT&T has invested in fiber-fed towers to deliver fixed wireless in their CAF II areas. While laudable, they will not achieve 100% coverage and thus not reach the threshold for abandoning their copper plant.



# Mobile Services Overstated as Well

- Mobile services also dramatically overstated in our region
- Further diminishes opportunity for broadband services
- Exacerbates the life/safety issues from de factor copper abandonment
- Red lines shows lack of coverage on roads from:
  - AT&T,
  - Verizon,
  - T-Mobile, or
  - Sprint

Source: Ohio Department of Transportation,  
2017 drive study conducted by  
ConnectedNation



# Gaslight Experience

“But dear..., the maps say you have  
both fixed broadband and mobile  
services”



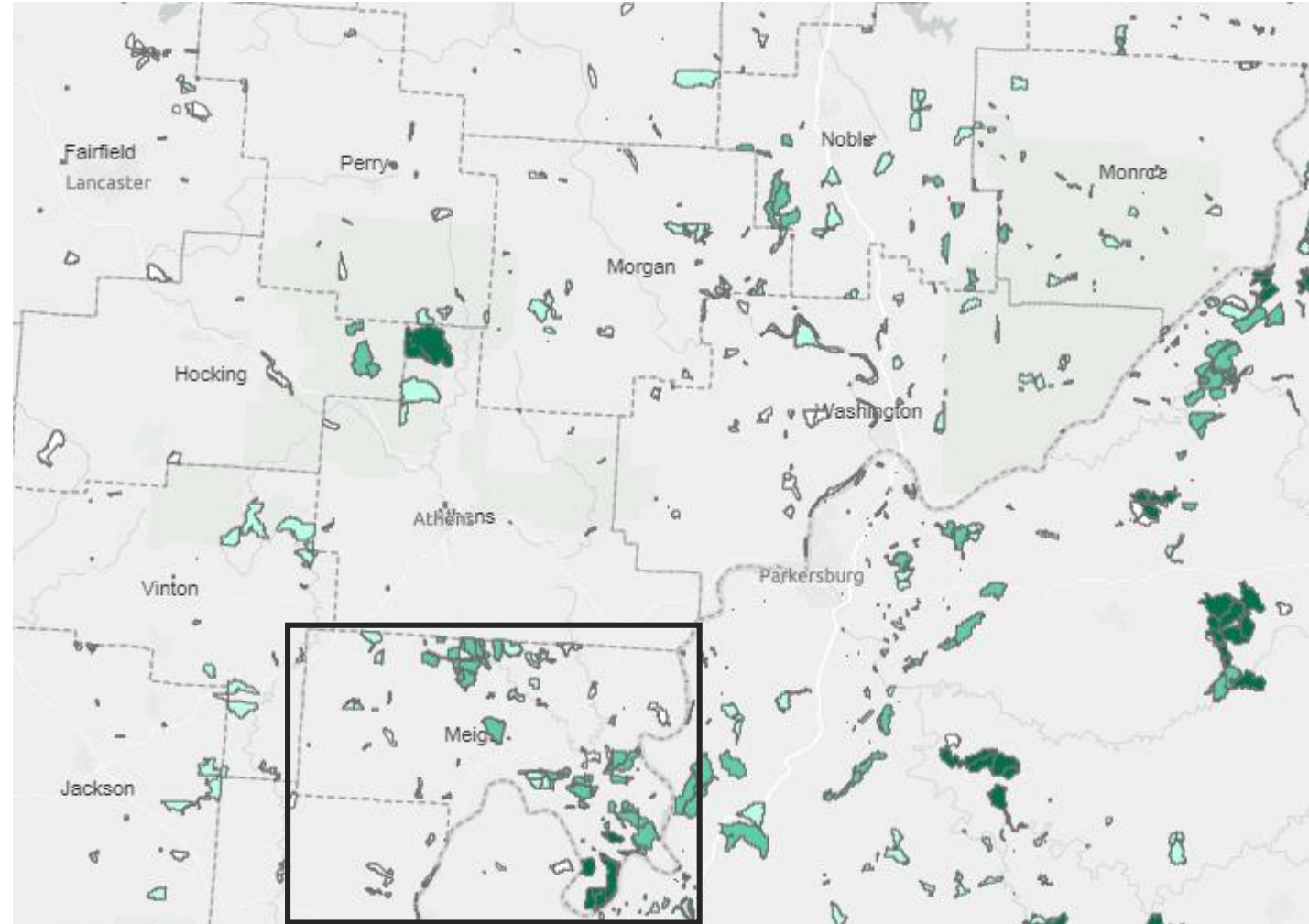


# Do Not Want to Repeat FCC Auction 903 in 2018

- The scattered teal-shaded census blocks were identified by FCC as unserved
- Ten-year subsidy offered
- In Meigs County, Ohio, the FCC funding totaled \$3.3 million

\$1.5 billion awarded nationwide

- **No one bid on any of the census blocks in Appalachian Ohio**
- The subsidy offered in these areas was too low to attract bidders





# Overarching Architecture

- Select representative study areas based on business and population density plus terrain
- Model technology options for feasibility
- Determine realistic cost estimates for 100% coverage
- Extrapolate architecture across service area
- Generate financial pro forma to determine magnitude of subsidy required

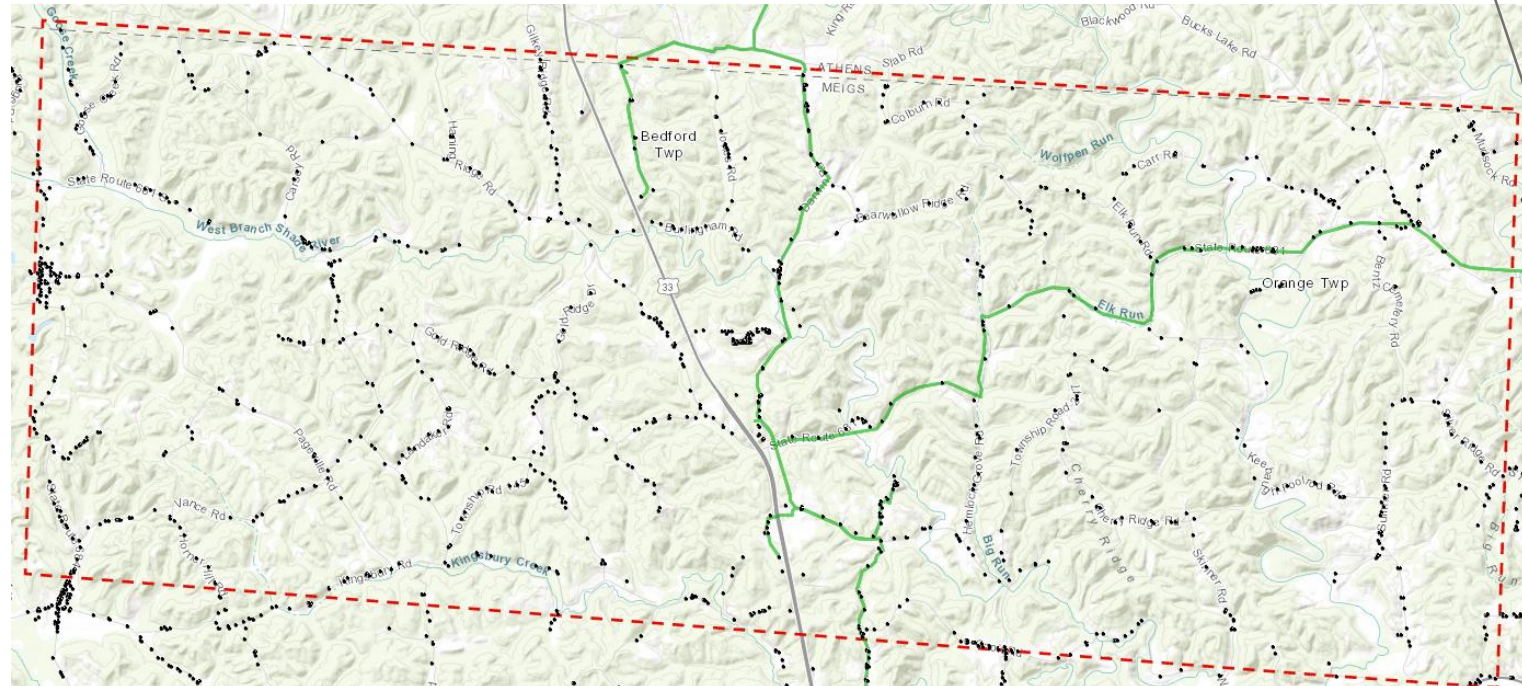
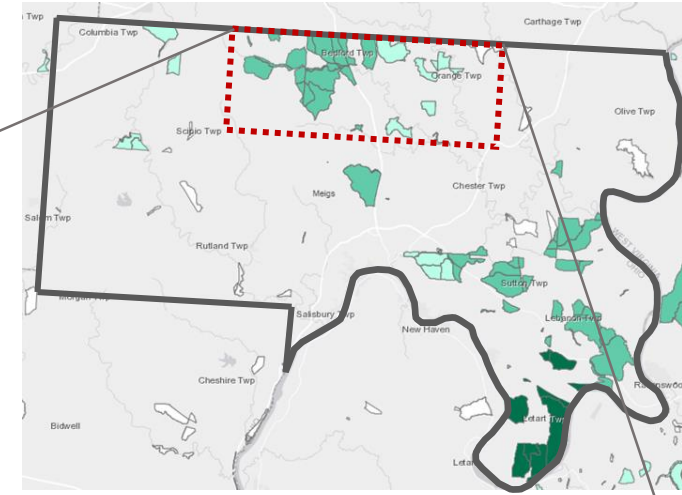


## Three Options

1. Satellite
2. Hybrid Wireless and Fiber
3. Fiber-to-the-Premise

# Engineering Zone A Meigs County

- Terrain typical of broader service area
- Population density below 20 households per square mile
- Scattering of businesses across the study area
- Significant foliage cover
- Pre-existing middle mile fiber
- 50 square miles





# Satellite Woes

- Round-trip creates signal delays (latency) that hamper video/web/audio conferencing
- Data caps and subsequent “throttling” reduce effectiveness for streaming services
- Many potential sources of interference of the low strength signals
- New low-orbit satellites face daunting technical challenges for the frequent hand-offs
- Rugged terrain and heavy foliage limits reach of satellite services



**Worst-case option for our region**

# Wireless Limitations

Flatlands



Wireless signals travel unobstructed across flat farmland,  
a feasible solution in these types of areas

Appalachia



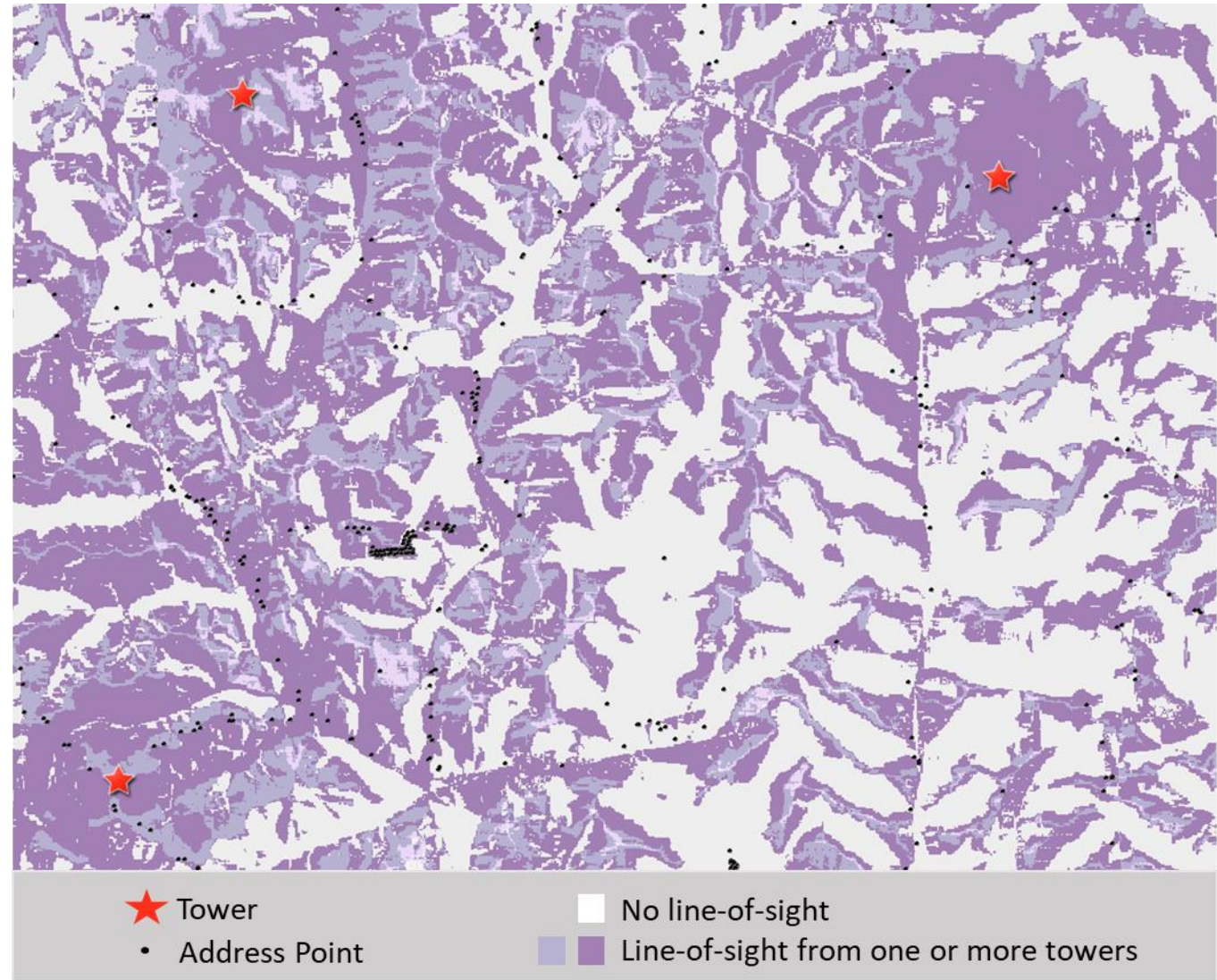
In our region, the combination of rugged terrain and  
heavy foliage cover severely limit both coverage and  
capacity



# Wireless Propagation Challenges

## Engineering Zone A

- 4 towers on high points, each 300' tall (3 shown)
- >\$1.5 million in infrastructure for just 60 square miles
- Many locations still unreachable
- High winds cause dish misalignments
- Lightning takes out entire tower's worth of electronics



# Fiber-to-the-Premise

## Only option for 100% Coverage

### Connect America Cost Model (CAM)

Pass the House

Connect to the Subscribers

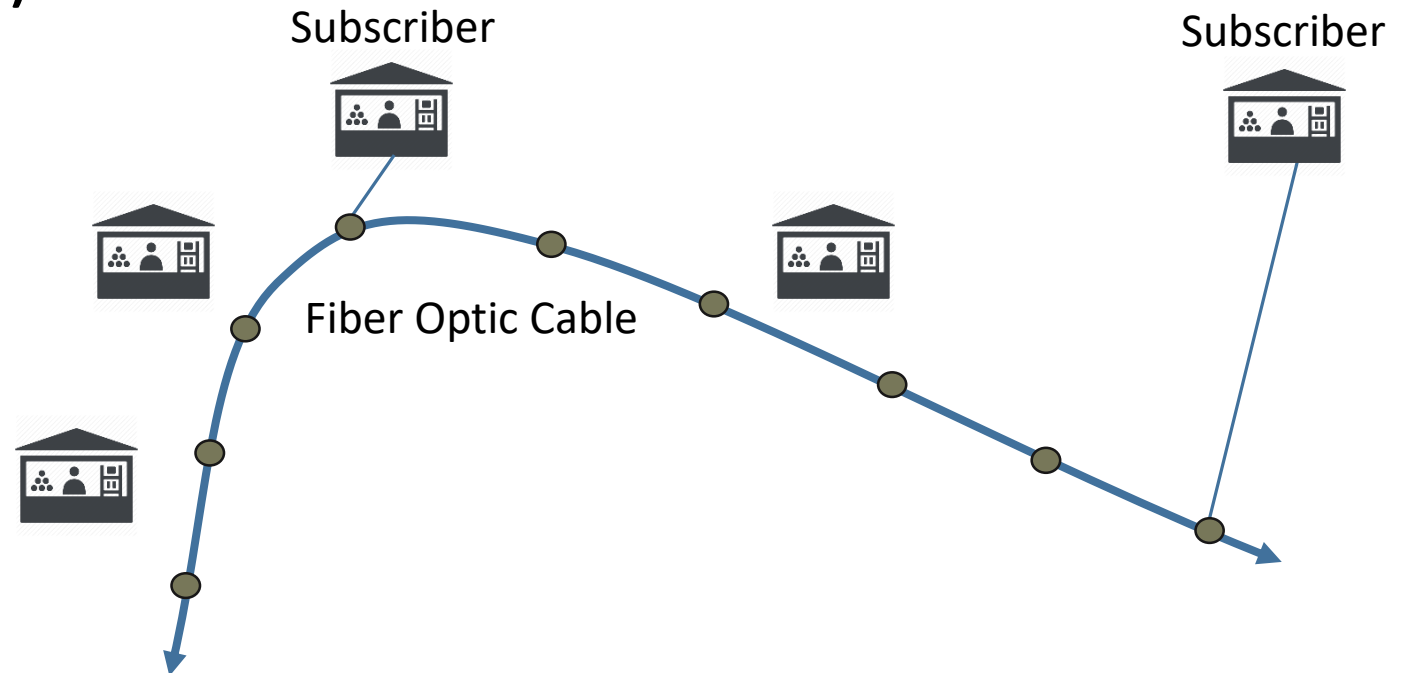
Operate and Maintain the Service

### Less **Projected Revenue**

% Market Penetration

\$ of Average Bill

Equals the **Reserve Price**  
offered in reverse auction



● Existing utility poles, approximately 25 per mile

# Auction 903 Reserve Pricing with Proposed Modifications

Target Areas	CAM	Subscriber Offset	Reserve		
			Auction 903	Modified to 40% at \$50	+ 10% Bump
Meigs County, Ohio (726 households across 238 square miles in 10 census block groups)	\$86.75	\$52.50	\$34.25	\$66.75	\$75.43
Athens, Perry and Hocking Counties, Ohio (214 households across 100 square miles in 4 census block groups)	\$100.95	\$52.50	\$48.45	\$80.95	\$91.05
Brooke and Ohio Counties, West Virginia (219 households across 49 square miles in 4 census block groups)	\$103.30	\$52.50	\$50.80	\$83.30	\$93.63
Marshall and Wetzel Counties, West Virginia (2,249 households across 800 square miles in 26 census block groups)	\$116.26	\$52.50	\$62.76	\$96.26	\$107.89

# Costs and Reserve Requirements in the Rural Expanse

Cost Element	Per Mile	Per Household	Monthly	
			BHRC “Mini-CAM”	FCC CAM, Auction 903
Base Fiber Infrastructure to Pass	\$30,432	\$3,900	\$33	Calculated based on FCC Connect America Fund Model (CAM)
Base Make-Ready to Pass	\$25,080	\$3,200	\$27	
Base Operations and Maintenance			\$24	
Subscriber Costs – Allocated*		\$731	\$25	
<b>Monthly Costs = Connect America Fund Model</b>			<b>\$109</b>	<b>\$87 to \$116</b>
Average Revenue per Subscriber			\$50	\$75
Market Penetration in First Six Years			x 40%	x 70%
<b>Less Subscriber Revenue Offset</b>			<b>- \$20</b>	<b>- \$53</b>
<b>Reserve Price in RDOF Auction</b>			<b>\$89</b>	<b>\$34 to \$63</b>

CAM may underestimate make-ready costs in Appalachia

\* Subscriber costs of \$2,200 plus \$34 per month for the projected 40% take-rate extended across the entire base of eligible premises



# Reserve Prices Necessary in Appalachia

Metric	Auction 903 In-Region	BHRC “Mini-CAM”
Connect America Cost Model (CAM)	\$87 to \$116	\$109
<b>Reserve with Current Threshold</b> Subtract 70% * \$75 = \$52.50	\$34 to \$63	\$56
Not viable – No responses to Auction 903 in Appalachian Ohio		
<b>Reserve with Proposed Threshold</b> Subtract 40% * \$50 = \$20.00	\$67 - \$96	\$89
<b>Reserve with Proposed Bump*</b> 10% Bump on Top of v.2	\$74 - \$106	

\* FCC suggested possible 10% bump in reserve price in the NPRM

# Limited ARPU

*“Cable One said its average revenue per user was up 5.5% to \$70.80 in the first quarter, giving it the **highest ARPU on residential broadband among publicly traded U.S. cable companies....**”*

*“Operator continues to marginalize video and move base to standalone broadband.”*

[Multichannel News May 2019](#)

- Our region is **not** going to out-spend the Cable One subscribers
- No legacy video to inflate average spend
- Broadband-only will be the most common subscription
- Spectrum offers 100/5 in surrounding towns for \$45/month
- Proposed ARPU = \$50 per month



Camper as a permanent dwelling on Markham Road in Meigs County, Ohio, a common reality in the region

# Limited Penetration and Low ARPU

- Families in substandard housing unlikely to pay for broadband
- Families with low household income unable to pay for broadband
- Areas in which broadband has NEVER been available will be slow to subscribe until benefits become clear
- Low capacity competition that meet the “Netflix adequacy threshold” may be retained for a period of time

## Appalachian Ohio\*:

11 poorest counties in Ohio  
17% - 30% household poverty  
34% to 60% near poverty

*Worse in the “rural expanse”*

\*Sources: The Ohio Poverty Report, Ohio Development Services Agency, February 2019, and [US Census Quick Facts](#)





# Limited Penetration

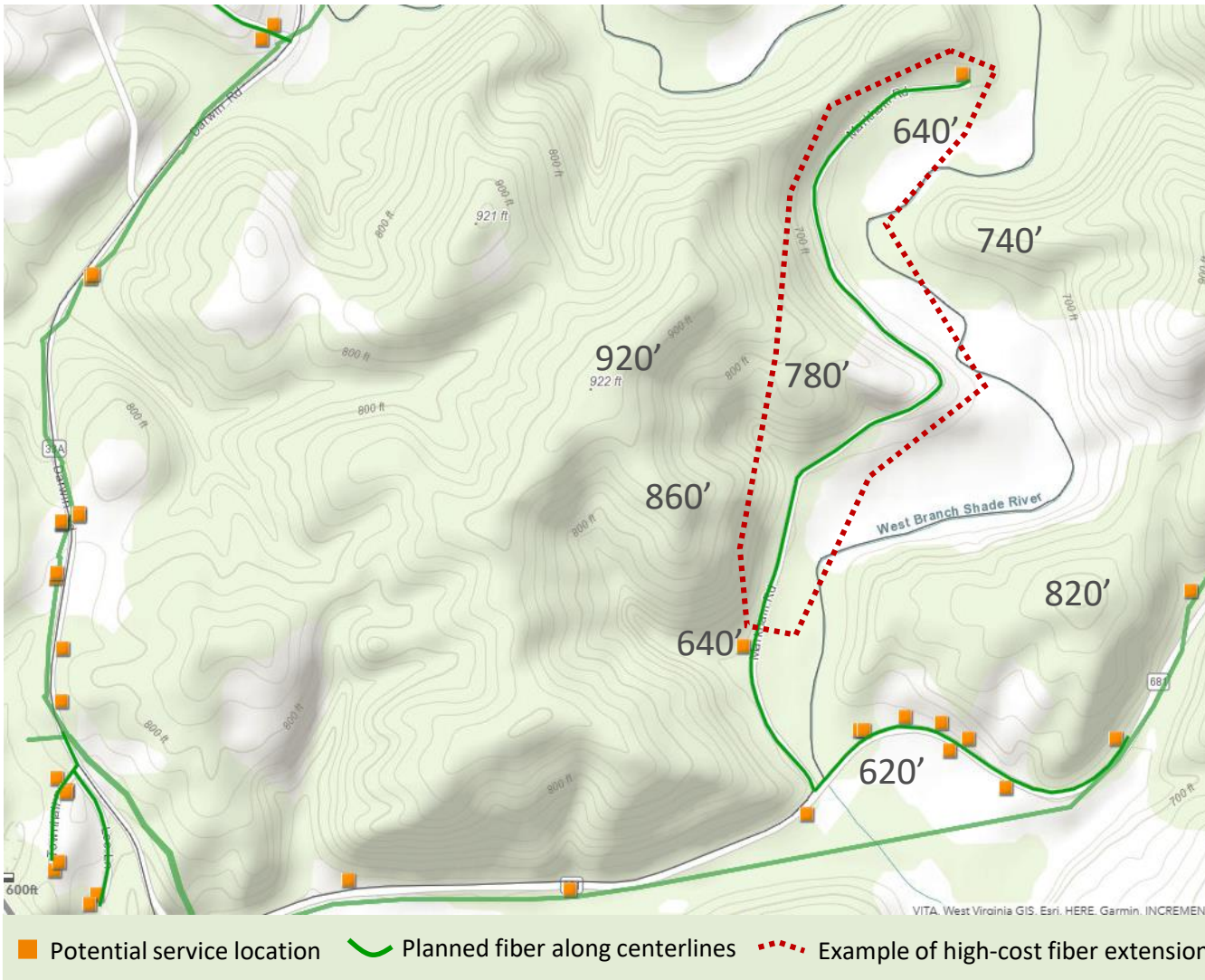
**Pew Internet Research\*** further supports lower penetration assumptions in low income households

Household Income	Less than \$30,000	\$75,000+
Internet Use	82%	98%
Home Broadband Subscription	56%	92%
Smartphone-Dependent Internet	26%	5%

Program Year	Proposed Market Penetration	
	Incremental	Cumulative
Year 3	16%	
Year 4	8%	24%
Year 5	8%	32%
Year 6	8%	40%

\* [Pew Internet Fact Sheet, Internet-Broadband](#), and [Pew Research Fact Tank, Digital Divide Persists....](#)

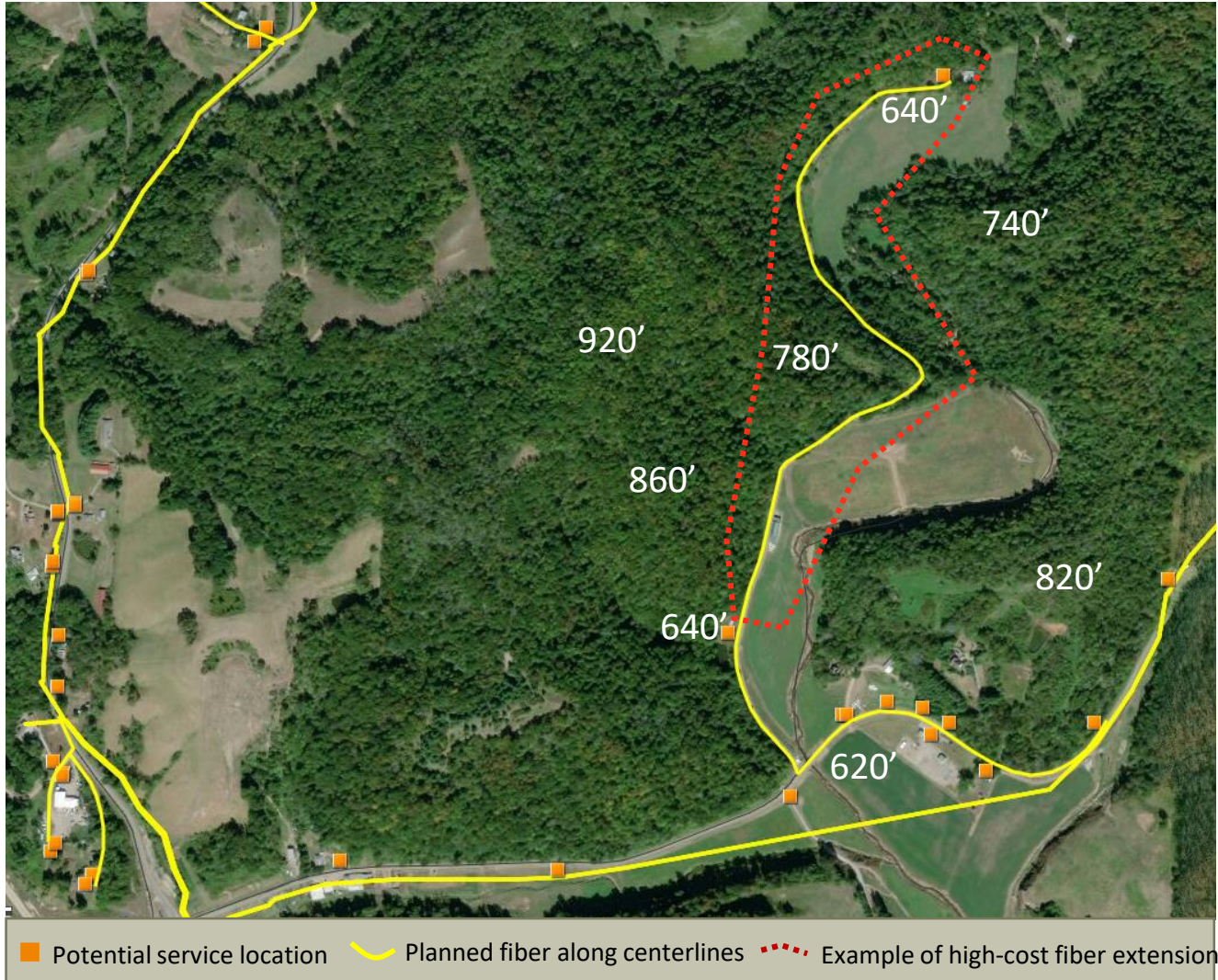
# Reaching 100% vs. 95%



- Delete the one home at far end of the road
- Save > 4,100 feet of fiber
- Reduces project cost by between \$19,400 and \$38,800
- Given intervening terrain and foliage, no affordable wireless option exists



# Reaching 100% vs. 95%



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# Deployment Timelines

When A-actual subscribes, to extend fiber from the street at A-address to the home will require:

- |                                      |   |
|--------------------------------------|---|
| Possible within<br>10 days           | <ol style="list-style-type: none"> <li>1. Engineering of drop to home and over-lash to splice point</li> <li>2. Quoting of additional cost to subscriber if drop longer than standard allowance</li> <li>3. Possible easements from neighbor</li> <li>4. Possible attachment application to pole-owner</li> </ol> |
| Timing outside<br>control of carrier | <ol style="list-style-type: none"> <li>5. Approval of additional cost by subscriber if drop longer than standard allowance (if applicable)</li> <li>6. Granting of easement by neighbor (if applicable)</li> <li>7. Response from pole owner and make-ready</li> <li>8. Installation</li> </ol>                   |



# Crucial to Hit the Target

Crucial proposed modifications to deliver the needed higher reserve prices in Appalachia

- 1. Strongly favor gigabit speeds in auction weighting**  
to incentivize long-term investments, e.g. fiber-to-the-premise
- 2. Lower market penetration assumption to 40%**  
from the current FCC assumption of 70%
- 3. Lower the average revenue per household to \$50**  
from the current FCC assumption of \$75



# Huge Portion of the Area Unserved or Underserved

			Of the Rural Expanse				
	Total Area	Rural Expanse	No 477 Data	Well Below 25/3	Barely Below 25/3	Above 25/3, HUBB 10/1 Only	RDOF Phase 1 Eligible
8-County Study Area	3,701	2,779	1,054	978	509	183	2,724
			38%	35%	18%	7%	98%
Of Total Area		75%					

One can understand the potential impact of RDOF on our region when considering:

- 75% of our 8-county study area is in the “rural expanse”
- 98% of that area will be in RDOF Phase 1 if the NPRM inclusion parameters survive into the Order



# Our Region's Only Hope

- Appalachian Ohioans clearly face a digital desert
- The CAF II allocations were unfortunately ineffective
- Strong support from the region reinforces our message
- If our proposed modifications result in over-pricing of the reserve, will be rectified during the reverse auction
- If not a wholesale change across Appalachia, then consider conducting an experiment in our study area
- **Our region desperately needs to advance the broadband agenda**
- **RDOF likely the only opportunity during the 2020's**